J. H. McCOY.

CONCRETE WATER TANK.

APPLICATION FILED FEB. 25, 1910.

982,080. Patented Jan. 17, 1911.

Fig. 1.

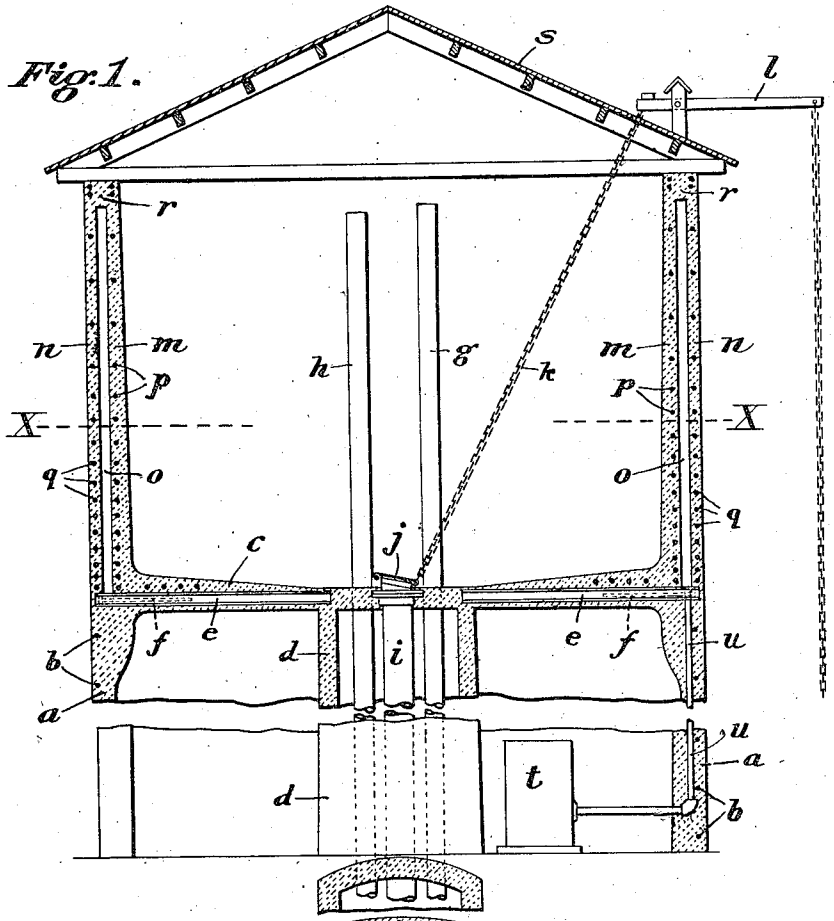
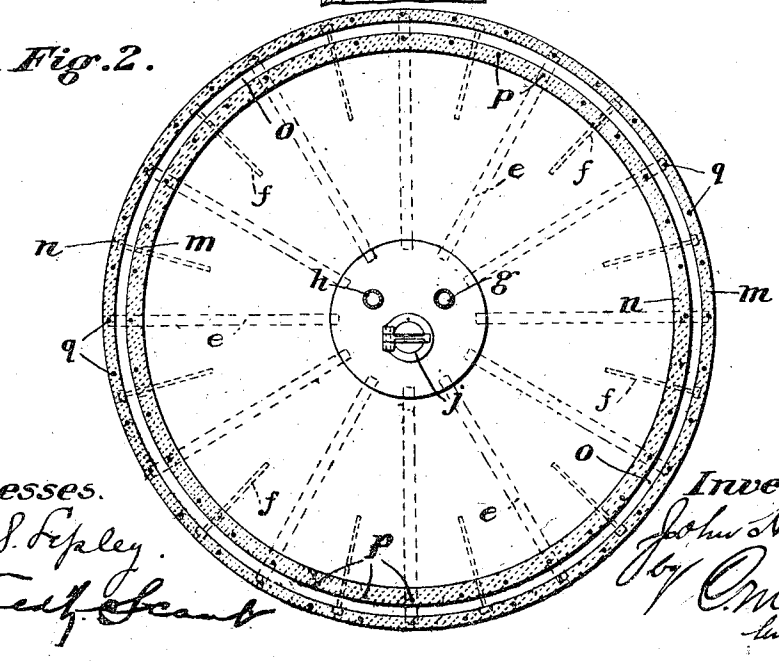


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

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CONCRETE WATER-TANK.

982,080. Specification of Letters Patent. Patented Jan. 17, 1911.

Application filed February 25, 1910. Serial No. 545,951.

To all whom it may concern:

Be it known that I, JOHN H. McCOY, a citizen of the United States, residing at Harrisville, in the county of Butler and State of Pennsylvania, have invented certain new and useful Improvements in Concrete Water-Tanks, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention consists of an improvement in water tanks or the like for the purpose of maintaining a supply of water above any suitable level, as the tanks of a railway.

The invention is designed to provide a tank of such character, circular in cross section, constructed of concrete or cement, having a lower base structure and an upper tank portion mounted thereon consisting of a floor or bottom and inner and outer cylindrical walls with an intervening air or vacuum cavity, reinforced and constructed as hereinafter more fully described.

In the drawings; Figure 1 is a central vertical sectional view, partly broken away through a tank structure constructed in accordance with my invention. Fig. 2 is a horizontal sectional view on the line X. X. of Fig. 1.

Generally stated, the entire structure consists of a cylindrical wall *a* of cement or concrete extending upwardly from the foundation or base, having annularly arranged reinforcing members *b* of any suitable kind and well understood in the art of reinforced concrete. The wall *a* preferably tapers upwardly as shown, to the point where the floor *c* of the tank structure proper is supported upon it, and the wall being preferably reinforced by an inwardly and upwardly sloping enlargement as indicated for insuring a good support for the inner tank wall.

While the structure, which embodies the present improvement, may be mounted upon any suitable base or structure, it preferably extends upwardly above a cylindrical concrete wall *a* and over a centrally arranged hollow supporting pier *d*.

e represents floor beams extending radially from around the upper edge of pier *d* to and resting upon the upper portion of wall *a* as shown, which beams are preferably steel I beams or of other suitable structural form. The outer wall *a*, the centrally arranged pier *d* and the radially arranged beams *e* thus constitute the main supporting structure for the floor or bottom *c* of the tank and its side walls, and the floor is likewise preferably reinforced by means of radially and annularly arranged reinforcing elements *f* of any suitable type, as headed bolts, and supported by the enlarged upper portion of wall *a* at the base of the tank wall referred to. The floor structure may, however, be of any suitable type or construction adapted to support the weight of the contents of the tank, and the tank is incidentally provided with inlet, overflow and supply pipes *g*, *h*, and *i*, the latter having a suitable valve *j* and opening mechanism therefor, as the flexible connection *k* and operating lever *l*.

The tank structure proper above the floor consists of annularly arranged inner and outer walls *m* and *n* respectively extending above the juncture of the floor or bottom *c* with lower wall *a* and with an intervening annular space *o*. As shown, the inner wall *m* is somewhat heavier in thickness than the outer wall, having an inner upwardly tapering face, and is provided with reinforcing annular tension members *p* of well known construction, preferably arranged closer together at the base of the wall than its upper portion and reinforcing the wall throughout.

The outer wall *n* extends upwardly straight, preferably, flush with the outer surface of lower wall *a* and is similarly reinforced by tension members *q*, while the intervening space *o*, which may be of any desired width, extends within a short distance of the top of the inner and outer wall, at which point the space is bridged across as indicated at *r* providing a solid terminal constituting the upper portion of the tank. The tank is provided with a covering roof *s* of any suitable design and with other features of construction or utility as ladders, etc., depending upon the use to which the apparatus is to be put.

The object of the intervening space *o* is to provide an insulating cavity to prevent the conduction of heat, whereby to obviate the freezing of the contents of the tank in cold weather. Owing to the peculiar construction of the inner wall, which is at all times under tension when the tank is full and which is strongly braced and reinforced by the annular tension members *p*, it will maintain the position with relation to the outer wall *n* without any intervening bracing connections. The outer wall *n* likewise, with

its tension bracing members q, will remain intact and immovable against any strains put upon it. This is due to the circular form of both walls; to the fact that both walls are braced by the embedded tension members, while the inner wall is subject to the pressure of the contents, and the outer walls to atmospheric pressure equally around its circumference. Each wall is therefore independent of the other, and the structure being circular, and the intervening space o correspondingly circular, a continuous annular cavity is thus provided between the walls. Ordinarily, this cavity may merely contain dead air which will operate to prevent the escape of the heat units of the water in cold weather, but in order to render the operation more efficient, if necessary, the air may be wholly or partially exhausted from the cavity o, for which purpose, I have provided a pump t connected with cavity o by a pipe u as shown, or the air may be exhausted in any other suitable manner. By locating the pipe u within the chamber formed within the foundation walls a it is conveniently positioned for operation and also well protected from climatic changes.

The advantages of the construction will be appreciated by all those familiar with this class of apparatus. The material employed is practically indestructible and not subject to decay from moisture or changes in temperature. The protection of the contents of the tank by a double circular wall construction with the intervening space, in the manner shown, insures against freezing, while the invention may be variously modified in different features of detail by the builder or skilled mechanic, all such changes are to be considered as within the scope of the following claims.

What I claim is,

1. A water tank consisting of an integral concrete structure comprising a circular floor portion and foundation, upwardly extending inner and outer closely adjacent concentric annular walls with an intervening annular space, said wall having a solid annular top bridging said space, and annular reinforcing members embedded in said walls, spaced apart at gradually increasing distances upwardly from the base of the walls, substantially as set forth.

2. In a concrete water tank, the combination of an outer circular foundation wall and an inner concentric circular foundation wall with an intervening annular space, radially arranged floor beams having their ends above the outer and inner foundation wall respectively, a floor incorporated with and carried by said walls and beams and inclosing the latter, an upwardly extending double-wall tank structure above the outer foundation wall consisting of outer and inner concentric walls with an intervening annular space, said wall having a solid annular top bridging said space, and annular reinforcing members embedded in said walls, said reinforcing members being spaced apart at gradually increasing distances upwardly from the base of said walls, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN H. McCOY.

Witnesses:
E. E. Wick,
Louise Spears.